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NATURAL DISASTER REDUCTION: HAZARD RESISTANT STRUCTURES

Technical session

Addendum

Cyclone shelters in areas prone to storm surge

Summary of presentation by Professor Jamilur R. Choudhury, Department of Civil Engineering, Bangladesh University of Engineering and Technology, Bangladesh

1. Storm surges, which accompany tropical cyclones, are among the most damaging of natural disasters in terms of loss of human lives. In Bangladesh alone, about 750,000 people have lost their lives in 20 major cyclones and storm surges during the past 30 years. The regions of the world which are vulnerable to such disasters include the islands in the south-west Pacific, south-east Asia (e.g., the Philippines, Viet Nam), countries adjoining the Bay of Bengal (viz., India, Bangladesh and Myanmar), south-east Africa, the Caribbean, and parts of the United States of America and Latin America around the Gulf of Mexico and Atlantic Ocean. Bangladesh is among the countries most vulnerable to devastating storm surges (with heights up to 7.5 m) which accompany cyclones. Around 5.3 million people live in the high-risk coastal areas and off-shore islands, with an average density of around 600 persons per square kilometre.

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2. The ideal solution for protecting human lives is to build houses above the surge level and make them strong enough to resist the lateral forces due to high wind and the accompanying surge. The investment necessary even for building only one room per family (around US$ 2,500) is too high for the poor people in the area. However, community shelters constructed during the past three decades have provided refuge to a large number of people. These are usually buildings of two or three stories supported on reinforced concrete columns, with the ground floor left open to allow the surge water to pass through the building unimpeded. Experience shows that in order to facilitate easy movement to the shelters, the shelters have to be very closely spaced with a maximum walking distance from house to shelters of around 1.5 kilometre. Also, people are reluctant to go to a shelter where there are no provisions for protecting livestock.

3. Based on the above considerations, design for integrated shelters for the human population as well as livestock (with one-storied buildings built on earthen mounds) have been prepared. Special provisions have been made for water supply, sanitation and lighting for these shelters. Since these are likely to be used as shelters only once in four or five years, it would be difficult to justify the huge investment unless some normal times use of the facilities is ensured. Moreover, experience shows that lack of regular use leads to rapid deterioration of the physical condition of the facilities.

4. A variety of uses for these multi-purpose shelters has been suggested. These include, inter alia, educational institutions (primary schools, secondary schools), community centres and family welfare centres.

5. To ensure full use of the shelters during cyclones and storm surfaces, the following measures are being implemented: improving the reliability of the warning system; training of volunteers for dissemination of warnings and assistance in evacuation to shelters; pursuing a public awareness programme, including regular drills; and ensuring community involvement in shelter management.

6. It is expected that, with the completion of the multi-purpose cyclone shelter project leading to the construction of around 2,500 new shelters, the colossal losses of human lives and livestock during cyclones and storm surges can be prevented. Moreover, the availability of these facilities during normal times for delivering educational and health services, and their use for other community activities, will have a far reaching effect in accelerating the pace of socio-economic development of the vulnerable communities.